

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-199. Canceled

200. (Currently Amended) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a non-occluding guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel adjacent to the lesion to be treated;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and
subsequent to dilating the lesion, using active suction to induce retrograde flow within the blood vessel.

201. (previously presented) The method of claim 200, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

202. (previously presented) The method of claim 201, wherein advancing the dilation catheter into the blood vessel includes advancing the dilation catheter over the guidewire.

203. (previously presented) The method of claim 201, further comprising advancing the guidewire to a position distal to the lesion to be treated.

204. (previously presented) The method of claim 203, wherein the guidewire is advanced to a position distal to the lesion subsequent to deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel.

205. (previously presented) The method of claim 200, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

206. (previously presented) The method of claim 200, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

207. (previously presented) The method of claim 200, further comprising infusing a contrast agent through the guide catheter into the blood vessel.

208. (previously presented) The method of claim 207, wherein infusing the contrast agent includes infusing the contrast agent through the evacuation lumen of the evacuation sheath.

209. (previously presented) The method of claim 200, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

210. (previously presented) The method of claim 200, wherein the non-occluding guide catheter has a substantially uniform cross-section along its length.

211. (previously presented) The method of claim 200, wherein the non-occluding guide catheter does not include an occlusive device.

212. (Currently Amended) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

infusing a contrast agent into the blood vessel, wherein at least a portion of the contrast agent passes through the evacuation lumen of the evacuation sheath into the blood vessel;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel adjacent to the lesion to be treated;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, inducing retrograde flow within the blood vessel.

213. (previously presented) The method of claim 212, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

214. (previously presented) The method of claim 213, wherein advancing the dilation catheter into the blood vessel includes advancing the dilation catheter over the guidewire.

215. (previously presented) The method of claim 213, further comprising advancing the guidewire to a position distal to the lesion to be treated.

216. (previously presented) The method of claim 215, wherein the guidewire is advanced to a position distal to the lesion subsequent to deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel.

217. (previously presented) The method of claim 212, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

218. (previously presented) The method of claim 212, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

219. (previously presented) The method of claim 212, further comprising removing the contrast agent from the blood vessel.

220. (previously presented) The method of claim 219, wherein removing the contrast agent includes inducing retrograde flow in the blood vessel.

221. (previously presented) The method of claim 212, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

222. (previously presented) The method of claim 212, wherein inducing retrograde flow includes applying active suction to the evacuation lumen of the evacuation sheath.

223. (previously presented) The method of claim 200, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

224. (previously presented) The method of claim 204, wherein the guidewire is advanced across the lesion to be treated prior to using active suction to induce retrograde flow within the blood vessel.

225. (previously presented) The method of claim 200, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

226. (previously presented) The method of claim 200, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

227. (previously presented) The method of claim 226, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

228. (previously presented) The method of claim 200, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

229. (previously presented) The method of claim 200, further comprising advancing a guidewire across the lesion to be treated without active suction.

230. (previously presented) The method of claim 212, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

231. (previously presented) The method of claim 215, wherein the guidewire is advanced to a position distal to the lesion prior to using active suction to induce retrograde flow within the blood vessel.

232. (previously presented) The method of claim 212, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

233. (previously presented) The method of claim 212, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and

wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

234. (previously presented) The method of claim 233, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

235. (previously presented) The method of claim 212, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

236. (previously presented) The method of claim 212, further comprising advancing a guidewire across the lesion to be treated without active suction.

237. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a non-occluding guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel distal to the lesion to be treated;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, using active suction to induce retrograde flow within the blood vessel.

238. (New) The method of claim 237, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

239. (New) The method of claim 237, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

240. (New) The method of claim 237, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

241. (New) The method of claim 237, further comprising infusing a contrast agent through the guide catheter into the blood vessel.

242. (New) The method of claim 241, wherein infusing the contrast agent includes infusing the contrast agent through the evacuation lumen of the evacuation sheath.

243. (New) The method of claim 237, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

244. (New) The method of claim 237, wherein the non-occluding guide catheter has a substantially uniform cross-section along its length.

245. (New) The method of claim 237, wherein the non-occluding guide catheter does not include an occlusive device.

246. (New) The method of claim 237, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

247. (New) The method of claim 237, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

248. (New) The method of claim 237, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

249. (New) The method of claim 248, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

250. (New) The method of claim 237, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

251. (New) The method of claim 237, further comprising advancing a guidewire across the lesion to be treated without active suction.

252. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

infusing a contrast agent into the blood vessel, wherein at least a portion of the contrast agent passes through the evacuation lumen of the evacuation sheath into the blood vessel;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel distal to the lesion to be treated;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, inducing retrograde flow within the blood vessel.

253. (New) The method of claim 252, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

254. (New) The method of claim 252, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

255. (New) The method of claim 252, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

256. (New) The method of claim 252, further comprising removing the contrast agent from the blood vessel.

257. (New) The method of claim 256, wherein removing the contrast agent includes inducing retrograde flow in the blood vessel.

258. (New) The method of claim 252, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

259. (New) The method of claim 252, wherein inducing retrograde flow includes applying active suction to the evacuation lumen of the evacuation sheath.

260. (New) The method of claim 252, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

261. (New) The method of claim 252, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

262. (New) The method of claim 252, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

263. (New) The method of claim 262, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

264. (New) The method of claim 252, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

265. (New) The method of claim 252, further comprising advancing a guidewire across the lesion to be treated without active suction.

266. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

- placing a non-occluding guide catheter proximate the ostium of the blood vessel;

- inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

- positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

- inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

- advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel distal to the at least one sealing surface;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, using active suction to induce retrograde flow within the blood vessel.

267. (New) The method of claim 266, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

268. (New) The method of claim 266, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

269. (New) The method of claim 266, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

270. (New) The method of claim 266, further comprising infusing a contrast agent through the guide catheter into the blood vessel.

271. (New) The method of claim 271, wherein infusing the contrast agent includes infusing the contrast agent through the evacuation lumen of the evacuation sheath.

272. (New) The method of claim 266, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

273. (New) The method of claim 266, wherein the non-occluding guide catheter has a substantially uniform cross-section along its length.

274. (New) The method of claim 266, wherein the non-occluding guide catheter does not include an occlusive device.

275. (New) The method of claim 266, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

276. (New) The method of claim 266, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

277. (New) The method of claim 266, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

278. (New) The method of claim 277, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

279. (New) The method of claim 266, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

280. (New) The method of claim 266, further comprising advancing a guidewire across the lesion to be treated without active suction.

281. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing

surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

infusing a contrast agent into the blood vessel, wherein at least a portion of the contrast agent passes through the evacuation lumen of the evacuation sheath into the blood vessel;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel distal to the at least one sealing surface;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, inducing retrograde flow within the blood vessel.

282. (New) The method of claim 281, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

283. (New) The method of claim 281, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

284. (New) The method of claim 281, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

285. (New) The method of claim 281, further comprising removing the contrast agent from the blood vessel.

286. (New) The method of claim 285, wherein removing the contrast agent includes inducing retrograde flow in the blood vessel.

287. (New) The method of claim 281, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

288. (New) The method of claim 281, wherein inducing retrograde flow includes applying active suction to the evacuation lumen of the evacuation sheath.

289. (New) The method of claim 281, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

290. (New) The method of claim 281, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

291. (New) The method of claim 281, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

292. (New) The method of claim 291, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

293. (New) The method of claim 281, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

294. (New) The method of claim 281, further comprising advancing a guidewire across the lesion to be treated without active suction.

295. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

- placing a non-occluding guide catheter proximate the ostium of the blood vessel;

- inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

- positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

- inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

- advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

- prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel across a cross-section of the blood vessel;

- advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and
subsequent to dilating the lesion, using active suction to induce retrograde flow within the blood vessel.

296. (New) The method of claim 295, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

297. (New) The method of claim 295, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

298. (New) The method of claim 295, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

299. (New) The method of claim 295, further comprising infusing a contrast agent through the guide catheter into the blood vessel.

300. (New) The method of claim 299, wherein infusing the contrast agent includes infusing the contrast agent through the evacuation lumen of the evacuation sheath.

301. (New) The method of claim 295, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

302. (New) The method of claim 295, wherein the non-occluding guide catheter has a substantially uniform cross-section along its length.

303. (New) The method of claim 295, wherein the non-occluding guide catheter does not include an occlusive device.

304. (New) The method of claim 295, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

305. (New) The method of claim 295, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

306. (New) The method of claim 295, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

307. (New) The method of claim 306, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

308. (New) The method of claim 295, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

309. (New) The method of claim 295, further comprising advancing a guidewire across the lesion to be treated without active suction.

310. (New) A method of treating a lesion within a blood vessel that supplies blood to the heart, comprising:

placing a guide catheter proximate the ostium of the blood vessel;

inserting an evacuation sheath within the guide catheter, the evacuation sheath having proximal and distal ends, an evacuation lumen, and at least one sealing surface proximate the distal end, the sealing surface being configured to seal against an inner surface of the blood vessel;

positioning the sealing surface within the blood vessel proximal to the lesion to be treated;

infusing a contrast agent into the blood vessel, wherein at least a portion of the contrast agent passes through the evacuation lumen of the evacuation sheath into the blood vessel;

inserting a dilation catheter into the evacuation sheath, the dilation catheter having a dilation balloon;

advancing the dilation catheter into the blood vessel to a position where the dilation balloon is proximal to the lesion to be treated;

prior to advancing the dilation balloon across the lesion to be treated, deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel across a cross-section of the blood vessel;

advancing the dilation balloon across the lesion to be treated;

dilating the lesion to be treated with the dilation balloon; and

subsequent to dilating the lesion, inducing retrograde flow within the blood vessel.

311. (New) The method of claim 310, further comprising advancing a guidewire through the evacuation sheath to a position proximal to the lesion to be treated.

312. (New) The method of claim 310, wherein inserting the dilation catheter includes advancing a stent into the blood vessel.

313. (New) The method of claim 310, wherein dilating the lesion to be treated with the dilation balloon includes positioning a stent proximate the lesion.

314. (New) The method of claim 310, further comprising removing the contrast agent from the blood vessel.

315. (New) The method of claim 314, wherein removing the contrast agent includes inducing retrograde flow in the blood vessel.

316. (New) The method of claim 310, wherein positioning the at least one sealing surface includes advancing the evacuation sheath beyond a major side branch of the blood vessel.

317. (New) The method of claim 310, wherein inducing retrograde flow includes applying active suction to the evacuation lumen of the evacuation sheath.

318. (New) The method of claim 310, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon prior to using active suction to induce retrograde flow within the blood vessel.

319. (New) The method of claim 310, wherein retrograde flow is induced within the blood vessel only after dilating the lesion.

320. (New) The method of claim 310, wherein the evacuation sheath includes a second sealing surface proximate its proximal end, and wherein deploying the at least one sealing surface to occlude normal antegrade flow within the blood vessel includes deploying both the at least one sealing surface and the second sealing surface.

321. (New) The method of claim 320, wherein deploying the second sealing surface includes creating a seal between the guide catheter and the evacuation sheath.

322. (New) The method of claim 310, wherein advancing the dilation balloon across the lesion to be treated includes advancing the dilation balloon without active suction.

323. (New) The method of claim 310, further comprising advancing a guidewire across the lesion to be treated without active suction.